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ABSTRACT

This paper indicates underlying philosophic assumptions which are compatible with the behavior analysis approach to child development. Four issues taken into consideration are (a) biology and environment, (b) structure and function, (c) traits and situations, and (d) mechanistic and organismic approaches to development. The following ideas represent in part the behavior analysis position on the issues discussed. Physiological structure and functioning influence the behavioral structure of a child's interactions with the environment and determine the broad behavioral processes which occur within child-environment interactions. Structural and functional analyses are complementary. The structure and function of child-environment interactions are mutually determined by development. Stimulus functions and response functions develop together and are defined with respect to one another. It is impossible to view stimulus functions as having more control over behavior than response functions. Organismic and mechanistic world hypotheses should not be viewed as necessarily antagonistic to one another. In summary, behavior analysis need not be exclusively environmentalistic, solely functionally oriented, situationist, or mechanistic. It is emphasized that philosophic assumptions influence the work of every scientist and are too important to be ignored. (Author/RH)

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Some Basic Considerations and Concepts

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Running Head: Basic Considerations

Some Basic Considerations and Concepts

In 1961, Sid Bijou and Don Baer (Bijou & Baer, 1961) proposed extending the concepts, methods, and principles of behavior analysis to the area of child development, a field that already encompassed a variety of approaches, among them normative-maturation theory (Gesell, 1954; Ilg & Ames, 1955), psychoanalytic theory (Erikson, 1950; Freud, 1949), and dynamic social learning theory (Bandura & Walters, 1963; Dollard & Miller, 1950; Sears, Maccoby, & Levin, 1957). Because developmental psychology was young and theoretically adventuresome and because of the close historical and conceptual ties behavior analysis had with social learning theory, a then dominant approach to the study of development, Bijou and Baer's proposal was accepted.

But that acceptance was tentative. Behavior analysts were considered radical, challenged traditional research protocol, appeared to offer only superficial explanations, and were, at times, quite disputatious. But, among the more serious objections was that many behavior analysts, in their empirical-inductive approach to theory construction, failed to consider very carefully their broader, metatheoretical assumptions, or at least to discuss them publically (White, 1970; see also criticisms by Kantor, 1963, 1968, 1970).

This failure to examine their metatheoretical assumptions led to some distortions and misunderstandings both within the approach and from the outside. And, with the ascendance of cognitive social learning theory (Bandura, 1977) and Piaget's cognitive-developmental theory (Favell, 1963; Piaget, 1970) -- approaches which did attend to metatheoretical issues -- further doubt was cast on the viability of behavior analysis in developmental psychology. With this, many behavior analysts lost interest and moved off in different directions. A large number more vigorously pursued basic research with infrahumans through

the experimental analysis of behavior (Skinner, 1966a), while others pursued problems of social importance through applied behavior analysis (Baer, Wolf, & Risley, 1968). Only a few continued to pursue the analysis of child behavior (Bijou & Baer, 1966; Etzel, LeBlanc, & Baer, 1977).

Through the years, however, a concern with theory grew among the animal researchers and the behavior analytic developmentalists. Not theory in the sense that everyday child-environment interactions could be translated into behavioral concepts and principles; those analyses were not new (Bijou, 1976; Bijou & Baer, 1965; Gewirtz, 1969, 1972; Keller & Schoenfeld, 1950; Skinner, 1953, 1957; Staats, 1963). Nor theory in the sense that hypothetical explanations may be posited for basic empirical relationships (Honig & Staddon, 1977; Ferster, 1978). But metatheory: those untestable, more philosophic assumptions that are the basis of all psychological theory, concepts and research methodology. This concern can be documented by Skinner's increasing attention to the philosophy of science and human values (Skinner, 1969, 1971, 1974, 1978); by Bijou and Baer's elaborations on a numbe of developmental concepts (Baer, 1970, 1976; Bijou, 1979; Bijou & Baer, 1978); by the inception of Willard Day's journal, Behaviorism; and by an increasing interest among behavior analysts in J.R. Kantor's interbehavioral psychology (Bijou & Baer, 1978; Morris, 1978; Mountjoy, 1976).

Today, behavior analysts articulate better their metatheoretical assumptions and in so doing have begun to temper some of the extreme positions held by and attributed to them, while still remaining truly behavioral. On the basis of this recent theoretical work, let us examine the behavior analysis position on several current, yet enduring issues: (a) biology and environment, (b) structure and function, (c) traits and situations, and (d) mechanistic and organismic approaches to development.

Biology and Environment

One problem that has plagued behavior analysis from the start is its presumed environmentalism. Behavior analysts have, perhaps, courted misrepresentation here through their focus of inquiry, but the presumption of environmentalism is inaccurate. Biological factors can and must be held accountable and as such may be viewed as influencing child-environment interactions in two ways. First, physiological structure and functioning influence the behavioral structure of a child's interactions with the environment and, second, they determine the broad behavioral functions of, or processes within, child-environment interactions.

Behavioral structures. With respect to behavioral structure, behavior analysts have explicitly recognized the role of biology through their use of such terms as response or organismic equipment (Bijou & Baer, 1978; Morris, 1978), which is said to define the structural capabilities and limits of the child's behavior (cf. Bijou & Baer, 1965, p. 10-30). This equipment should be understood in terms of both phylogenetic and ontogenetic contributions made to it (Kantor, 1959), that is, in terms of evolution and in terms of the pre- and post-natal conditions of development which, aside from general experience, include nutrition, disease, and injury. Given that the phylogenetic and ontogenetic contributions encompass maturation and environmental impact, respectively, the organismic equipment must be understood as undergoing continuous change, thereby always altering the behavioral capabilities and limits of the child's behavior. Behavior analysts sometimes assume that biological structure and functioning are laid down at birth, never to be altered, but such is not the case.

Behavioral functioning. With respect to behavioral functioning, behavior analysts have not been explicit about the role of biological heredity. But it seems quite clear that the processes involved in respondent and operant behavior are part of our inheritance. In other words, respondent and operant processes may be viewed as inherited behavioral functions, just as are Freud's process of cathexis (Freud, 1949) or Piaget's functional invariants of organization, adaptation, assimilation, and accomodation (Piaget, 1970).

In regard to respondent and operant functions, both unconditioned and conditioned interactions may be noted. On the unconditioned side, evolution has endowed children with some behavior, called respondent, that is a function of unconditioned antecedent eliciting stimuli and with other behavior, called operant, that is a function of unconditioned consequences, that is, primary reinforcers. On the conditioned side, evolution has endowed children with behaviors that develop as a function of certain interactions with the environment, the processes of which are called respondent and operant conditioning, and the products of which are, for the former, conditioned eliciting stimuli and conditioned responses and, for the latter, conditioned reinforcers, discriminative stimuli, and elaborated behavior.

It is of interest to note that the inherited function of operant conditioning may be related to an underlying biological process or function -- that of natural selection. A parallel may be drawn between these ontogenetic and phylogenetic processes in that changes in the environment of an individual strengthen and extinguish certain behaviors of its response repertoire in a manner analogous to which changes in the environment of a species strengthen and extinguish certain physiological structures and functions of its organismic equipment (Skinner, 1966b, 1969, 1974, 1977). On the basis of this parallel,

Skinner has suggested that operant conditioning "has utilized a physiological system that had already been developed in natural selection" (Skinner, 1975, p. 120). From this analysis, it should be clear that not only does the structure of behavior have a biological base, but also that the basic behavioral functions are inherited -- again, just as they are for Freudians and Piagetians. For them, the biologically based functions operate in a general manner which is assumed to be relatively consistent across children. Individual differences in these functions are of little concern in the attempts to describe species-wide psychological processes or functions. Behavior analysts have been no different in their approach to respondent and operant functions.

Before concluding this section, it should be pointed out that a belief in respondent and operant conditioning does not thereby make one an environmentalist, as opposed to a nativist (Herrnstein, 1977). The environmentalist-nativist dimension is defined by the relative weight one gives to (a) unconditioned respondent behavior, unconditioned eliciting stimuli, and the number and strength of primary reinforcers as opposed to the weight one gives to (b) conditioned eliciting stimuli, conditioned reinforcers, and discriminative stimuli in accounting for development. Being a behavior analyst requires no special belief in the nature or extent of conditioning -- that is an empirical matter.

But, it is true: behavior analysts have focused primarily on conditioning processes and have glossed over organismic factors. This emphasis, however, seems to be changing as is illustrated by (a) recent research on the limits of and prepotencies for conditioning (Schwartz, 1974; Seligman & Hagar, 1972; Shettleworth, 1972); (b) the publication of behavior analytic texts and chapters emphasizing organismic variables (e.g., Brody & Harris, 1977; Fantino & Logan,

1979; Teitelbaum, 1977; Thompson & Boren, 1977); and (c) recent articles published in applied behavioral journals (e.g., Rose, 1978), especially in the area of behavioral medicine and pediatrics (see Journal of Applied Behavior Analysis, 1978, 11, No. 4). We would hope to see more research that links a nonreductionistic physiological psychology (e.g., Kantor, 1947) with behavior analysis.

Structure and Function

As just described, understanding development focuses, in part, on the biological structure and functioning. But, we must also have an understanding of psychological or behavioral structure and functioning and, thus, must focus on (1) the structure of child-environment interactions and (2) the functioning of child-environment interactions.

Interactional structure. All child-environment interactions have a form, topography, or structure that may be described (or potentially described) by the objective measurement of the participating behavior and environment. A structural analysis of behavior and environment entails reliable, physical descriptions of their respective topographies or forms, ranging from relatively discrete units, such as, respectively, a discrimination panel press and word of social approval, to more lengthy and complex sequences, such as descriptions of the course of development over time and the grammatical structure of a parent's verbal behavior. A structural analysis of child-environment interactions, then, entails the coordination of the formal descriptions of both behavior and environment; it focuses on their organization. While structural analyses of child-environment interactions are conducted by behavior analysts as baseline and naturalistic observations, that approach has not been broadly used as a means of studying development -- such is the functional heritage of behaviorism.

Interactional function. Structural analyses of child-environment interactions do not, however, provide direct understanding of behavior-environment functioning, even though they may be suggestive. A formal analysis of behavior does not tell us directly about response functions (Kantor, 1959), that is, what it "means" to the environment, its response class (Skinner, 1935), or whether it functions as respondent or operant behavior (Skinner, 1953). Likewise, a formal analysis of a stimulus does not tell us directly its stimulus function (Kantor, 1959), that is, what it "means" to the child, its stimulus class (Skinner, 1935), or whether it functions as an eliciting, discriminative, or reinforcing stimulus (1953). In the analysis of interactional functioning, behavior and environment cannot be understood without reference to the effects of one upon the other. And that understanding is most expediently achieved when behavior and environment are experimentally manipulated, and not merely correlated with each other or with time.

Structure-function relationships. A structural analysis of child-environment interactions, however, is in no way incompatible with a functional analysis; in fact, they are complementary. Structural analyses are useful in gaining a complete understanding of behavior and its development (Catania, 1973, 1978; Richelle, 1976), especially in the initial stages of investigation, and for suggesting remedial strategies when development is delayed or deviant (Wahler, 1975; Wetherby & Morris, in press). Both the analysis of structure and of function are legitimate means for understanding child-environment interactions. Each has its own relatively distinct set of concerns, just as the study of anatomy and the study of physiology do in biology. But, the structure and function of child-environment interactions are interrelated in that they are mutually determined by development, just as anatomy and physiology are mutually determined by evolution (see Catania, 1978).

Unfortunately, those concerned with interactional structure and those concerned with interactional function have used different sets of languages and assumptions -- cognitive/organismic and behavioral/mechanistic, respectively (Catania, 1973, 1978) -- and have tended to assert the importance of one means of analysis over the other. These nondefining but correlated properties of language and assumptions have made concerns over structure and function appear incompatible and have led psychologists to exclude or define away certain areas of inquiry. A behavior analyst, however, can be either structurally or functionally oriented, as the terms are defined here. Structural analyses of child-environment interactions should not be dismissed from the system, nor should the structural descriptions of child-environment interactions provided by those who may have a different language or hold different assumptions, or who may draw different conclusions about the functions of behavior than behavior analysts. The behavior analyst can and should look to the data available from other developmentalists.

Persons and Situations

A clearer understanding of the behavioral approach to child-environment functioning and the critical role of interactional history in the development of stumulus and response functions is relevant to the trait-situationism controversy wherein it is debated whether personal state/trait variables or environmental situations have the primary control over behavior (see Bowers, 1973; Mischel, 1968, 1973).

In that stimulus functions and response functions develop together and are defined with respect to one another, it is impossible to view stimulus functions as having any more control over behavior than response functions -- they are mutually and interdependently defining. The stimulus function of

a situation does not compel behavior to occur except through a person's response functions for that situation; and a person's response functions do not compel interactions except through the situation's stimulus functions for that behavior. Situations do not possess independent power to control psychological interactions any more than persons possess independent power through states or traits to organize and direct psychological interactions. Psychological interactions are controlled -- if that is the word -- mutually by stimulus and response functions, both of which are the products of an interactional history. Interactions may display those qualities we attribute to personal or situational control depending on how we view them or investigate them (Bowers, 1973), but those attributions are short-hand conventions and are not always useful as analytic methods. They also derive from an overemphasis on mechanistic as opposed to organismic thinking.

Kenneth Bowers, in his well-known critique of situationism in psychology, argued that "both the trait and situationist positions are inaccurate and misleading and that a position stressing the interaction of a person and situation is both conceptually satisfying and empirically warrented" (Bowers, 1973, p. 307). Behavior analysts would agree with that statement. They would argue, however, with Bower's narrow understanding of behaviorism, which he equated with situationism. More important, they would find neither conceptually satisfying nor empirically warrented his insistance that special, personal, cognitive controls give meaning to person-situation interactions. That approach takes the meaning out of an interaction as though it were independent of it, and then makes meaning an attribute of the organism alone -- makes it organocentric, rather than organismic. In doing this, meanings, along with other states and traits, are posited as internal causes and as

the glue for person-situation interactions when the glue is actually interactional history or development, just as evolution is the glue of species-environment interactions. This argument does not deny the existance of inner private causes, only the creation of causes that have neither a formal behavioral or environmental status (Schnaitter, 1978; Zuriff, 1979).

To summarize descriptions of an interactional history, from which have evolved currently operating stimulus and response functions, with trait or knowledge terms is not objectionable. What is objectionable is to reify those terms to make them causal agents. Predictions about child-environment interactions can be made on the basis of knowledge about behavior and on the basis of knowledge about situations. But the ability to do so does not give special causal power to either source. To assert that it does moves us from interactionism to either organocentrism or environmentalism.

Organismic and Mechanistic World Views

Organismic and mechanistic models or world hypotheses (Pepper, 1942) have received much attention in developmental psychology of late. Some of that attention has served as the basis for critical appraisal of the meta-theoretical underpinnings of various theories (e.g., Overton & Reese, 1973; Reese & Overton, 1970); other of that attention has served as a basis for championing cognitive approaches over behavioral approaches (e.g., Lerner, 1976).

Among some of the attributes of the organismic model is that causes and effects are not temporally separated. Child and environment interact simultaneously and dynamically as part of a unitary event. Neither the child nor the environment should be separated out as active or passive; it is the system that is active. Mechanistic approaches do assume a temporally oriented

cause-and-effect relationship between antecedent and consequent events. Child and environment interact successively, each relying on the other as its source of activity. Such an approach serves as a useful stipulative and pragmatic rule for the conduct of science. The mechanistic model, though, may have some limitations as we gain a more sophisticated perspective on child-environment interactions. But our science of developmental psychology probably has not proceeded far enough yet to make full use of organismic models. Complex mechanistic models may remain sufficient -- even if incomplete -- for some time and for a large part of everyday developmental psychology. Analogously, Newton's mechanistic model of physics and astronomy sufficed for many years before Einstein revolutionized our perspectives and even today the Newtonian model remains adequate for most of what physicists do.

Unfortunately, some of the contrasts between organismic and mechanistic models have been improperly drawn (see Catania, 1978, for further discussion). The organismic model has become aligned with developmental approaches emphasizing cognition; the mechanistic model has become aligned with behaviorism. It is important to point out, however, that a mechanistic model may be either cognitive, as in information-processing or computer analogies, or it may be behavioral, as in learning theory; and that the organismic model also may be cognitive, as in Piaget's cognitive-developmental theory, or behavioral, as in J.R. Kantor's interbehaviorism. Organismic models need not be cognitive models; they may be behavioral. For those interested in such a possibility, we recommend J.R. Kantor to you (Kantor, 1924, 1926, 1959, 1971).

Cognitivism and behaviorism aside, analyses of the different world views are in general agreement that the basic metatheoretical assumptions of the mechanistic and organismic approaches are incompatible in fundamental ways,

never to be reconciled by any eclecticism (Pepper, 1942). But these world views may be brought together in several ways (Reese & Overton, 1970), one of which is to adopt organismic assumptions, yet do everyday science following mechanistic reasoning; the reverse, however, does not seem possible. The science of physics provides an example of such an organismic-mechanistic relationship in that most of everyday physics is accomplished with Newton's mechanics, despite the conceptual and sometimes practical advantages of relativity theory. Within behavior analysis, it has been suggested that the relationship between Skinner and Kantor can be similarly viewed (Morris, 1978). The organismic and mechanistic world hypotheses should not be viewed as necessarily antagonistic to one another, but rather as providing different degrees of analytic completeness. Whether one is behavior analytic or not is unimportant to adopting one view or the other.

Conclusion

In summary, we have tried to illustrate that behavior analysis need not be environmentalistic, solely functionally oriented, situationist, or mechanistic. The ideas we have put forth are rough and unfinished, and probably naive in some respects, but metatheory is a relatively new activity for behavior analysts. It is also a necessary activity. Many behavior analysts, however, dismiss metatheory as unimportant, and are joined by other psychologists in viewing the recent interest in world hypotheses as a mere fad. This is unfortunate because no scientist operates outside of metatheory -- cultural context and personal history see to that. To assume that one does operate outside of those conditions is to operate in ignorance of basic influences over scientific behavior.

Behavior analysts typically adopt an empirical-inductive approach to theory construction as opposed to a hypothetical-deductive approach (Kantor, 1938; Skinner, 1950). They work first to establish a data base, then to organize those data into empirical constructs, and finally to organize those empirical constructs into a theory. Behavior analysis is atheoretical, here, in the sense that the science is too young for a complete theory of development and in that it is unwilling to accept theoretical explanations of data at a different level from behavior itself (Skinner, 1950). But many behavior analysts have improperly extended this atheoretical stance to considerations of metatheory. To be empirical-inductive is not to operate without general assumptions and presuppositions, that is, outside the realm of metatheory. Metatheory is there and behavior analysts should attend to it; their theory of development can only be improved by such attention (see Kantor, 1963, 1968, 1970).

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